CLAIMS

1. A magnetic random access memory (MRAM) cell, comprising:

a word line;

a bit line perpendicular to the word line;

a magnetic device disposed at an intersection of the word line and the bit line; and

a pair of writing magnets, each writing magnet disposed at an end of the magnetic device, wherein the pair of writing magnets switches a magnetic alignment of the magnetic device during a write operation.

2. A MRAM cell as recited in claim 1, wherein a current in the word line and the bit line generates a magnetic field on the pair of writing magnets during the write operation.

3. A MRAM cell as recited in claim 1, wherein the pair of writing magnets and the magnetic device are aligned along a long axis of the memory cell.

4. A MRAM cell as recited in claim 3, wherein the long axis of the memory cell is not aligned with the word line and the long axis is not aligned with the bit line.

5. A MRAM cell as recited in claim 1, wherein the magnetic device includes a magnetic tunnel junction (MJT).

6. A MRAM cell as recited in claim 1, wherein the magnetic device includes a giant magnetoresistance (GMR) material.

7. A MRAM cell as recited in claim 1, wherein the magnetic device includes a colossus magnetoresistance (CMR) material.

8. A MRAM cell as recited in claim 1, wherein the magnetic device includes an anisotropic magnetoresistance (AMR) material.

9. A MRAM cell as recited in claim 1, wherein each writing magnet includes a soft ferromagnetic material.

10. A MRAM cell as recited in claim 1, wherein each writing magnet includes a general ferromagnetic material.

11. A method for performing a write operation to a magnetic random access memory (MRAM) cell, comprising the operations of:

supplying a current to a word line and a bit line of the MRAM cell;

generating a magnetic field using the currents in the word line and the bit line, wherein the magnetic field is applied to a pair of writing magnets disposed at either end of a magnetic device; and

generating a field strength using the writing magnets, the field strength capable of switching a magnetic alignment of the magnetic device.

12. A method as recited in claim 11, wherein the current applied to the word line and the bit line is on an order of magnitude of 100 μA.

13. A method as recited in claim 11, wherein each writing magnet includes a soft ferromagnetic material.

14. A method as recited in claim 11, each writing magnet includes a general ferromagnetic material.

15. A method as recited in claim 11, wherein the pair of writing magnets and the magnetic device are aligned along a long axis of the memory cell.

16. A magnetic random access memory (MRAM) array, comprising:

a plurality word lines and bit lines, each bit line being perpendicular to the plurality of word lines;

a plurality of magnetic devices, each magnetic device disposed at an intersection of a word line and a bit line; and

a plurality of writing magnets, each writing magnet disposed at an end of a magnetic device, wherein writing magnets associated with a particular magnetic device switch a magnetic alignment of the particular magnetic device during a write operation.

17. A MRAM array as recited in claim 16, wherein each magnetic device is associated with two writing magnets, and wherein each writing magnet is associated with one magnetic device.

18. A MRAM array as recited in claim 16, wherein each magnetic device is associated with two writing magnets, and wherein each writing magnet can be associated with two magnetic devices.

19. A MRAM array as recited in claim 16, wherein a current in a particular word line and a current in a particular bit line generates a magnetic field on a pair of writing magnets during the write operation.

20. A MRAM array as recited in claim 19, wherein each intersection of a word line and a bit line includes a pair of writing magnets and the magnetic device that are aligned along a long axis of a memory cell formed at the intersection.